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**NAVY PUBLIC WORKS CENTER
NORFOLK, VIRGINIA
UTILITIES DEPARTMENT**

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE

**REPLACE 34.5 KV SWITCHYARD OPERATING
TRANSFORMER**

**PROCEDURE NUMBER
WC 624 HVE 094**

SIGNED: _____
(DATE)

APPROVED: _____
(DATE)

SAFETY PROFESSIONAL: _____
(DATE)

MANAGEMENT OFFICIAL: _____
(DATE)

REVISION

A

WC 624 HVE 094

REPLACE 34.5 KV SWITCHYARD OPERATING TRANSFORMER

DISTRIBUTION

CODE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE
601.C3							
620							
622							
610.E1							
622.3							

WC 624 HVE 094

REPLACE 34.5 KV SWITCHYARD OPERATING TRANSFORMER

REVISIONS

REV	DESCRIPTION	SIGNATURE	DATE
A	Initial Issue.		

REPLACE 34.5 KV SWITCHYARD OPERATING TRANSFORMER

Purpose:

Procedure to replace an operating transformer connected to the open bus of a 34.5 kv switchyard.

Potential Energy Sources:

1. 34.5 kv cables and equipment of switchyard.
2. 34.5 kv outdoor bus.

Tools and PPE:

Tools: Auger truck, High voltage tester, shotgun stick, hand tools, hand line, certified sling, and a Multimeter. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, work gloves, safety glasses, and back brace if required by back injury prevention and control program. The class of rubber gloves and sleeves will depend on the exposure voltage as per the following: Class 0 - up to 1,000 volts, Class 1 - up to 7,500 volts, Class 2 - up to 17,000 volts, Class 3 - up to 26,500 volts, Class 4 - up to 36,000 volts.

References:

1. PWC Occupational Safety and Health Program Manual, PWCNORVAINST 5100.33E
2. Occupational Safety and Health Standards for General Industry (29 CFR PART 1910): Subpart I, Personnel Protective Equipment; Subpart R, Electrical Power Generation / Transmission / Distribution; Subpart S, Electrical
3. NFPA 70 E approach distances to exposed, energized, electrical conductors and circuit parts.
4. SOP WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)
5. SOP WC 622 HVE 007, Switchout And Switchback Energized Circuit
6. SOP WC 624 001, Set Up And Secure Bucket/Auger Truck

Procedures:

1. WC 622 personnel will deenergize the outdoor, 34.5 kv, bus by deenergizing all circuits attached to the bus. WC 622 personnel will follow SOPs
WC 622 HVE 007, Switchout and Switchback Energized Circuit
WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)
2. Using a high voltage tester test all deenergized equipment to verify they are deenergized. Before the equipment is checked, test the high voltage tester on a known energized circuit to verify the tester is working. Test each deenergized item separately, taking care not to cross phase during test. If voltage is detected, stop the test and (a) notify WC 622 personnel that the circuit is still energized, (b) wait for WC 622 personnel to correct the problem, (c) perform the deenergization verification test once again after WC 622 personnel finish switching operations and declare the equipment deenergized. If no voltage is indicated, retest the high voltage tester to re-verify it is working properly. Wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat while testing.

The required PPE for the operating transformer change out will be work

REPLACE 34.5 KV SWITCHYARD OPERATING TRANSFORMER

gloves, safety glasses, safety shoes, hard hat and a back brace if required to wear one. Refer to JHA for details.

3. Using a shotgun stick, open the operating transformer's fuse cut out.
4. Set up an Auger truck per SOP WC 624 001, Set Up And Secure Bucket/Auger Truck.
5. Identify, mark, and disconnect
 - a) primary conductors
 - b) secondary conductors(ground wires last)
 - c) case grounds
6. If applicable, disconnect conduits.
7. Attach a certified sling to the boom winch line and to the transformer. Remove the hold down bolts, lift, and place transformer onto a truck so it can be transported to a proper storage site for disposal.
8. Attach a certified sling to the boom winch line and to the transformer. Lift and position the new transformer. Align bolt holds and secure the unit with the hold down bolts.
9. Connect
 - a) primary conductors
 - b) secondary conductors(ground wires first)
 - c) case grounds
10. If applicable, re-connect conduits.
11. Secure the Auger truck per SOP WC 624 HVE 001.
12. Using a shotgun stick, close the operating transformer's fuse cut out.
13. WC 622 personnel will energize the outdoor, 34.5 kv, bus by deenergizing all circuits attached to the bus. WC 622 personnel will follow SOPs
 - WC 622 HVE 007, Switchout and Switchback Energized Circuit
 - WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)
14. Check the new operating transformer's operation by measuring the transformer's output voltage in the control house.
15. Transport old operating transformer to proper storage site.

END